

PIPELINE CONSTRUCTION SPECIFICATION

1. SCOPE

The work shall consist of furnishing materials and installing all components of the pipeline, as outlined in this specification and the drawings.

2. MATERIALS

All materials used shall conform to the quality and grade noted on the plans, set forth in Section 7, or as otherwise listed below:

PIPE

All pipes shall be clearly marked with the appropriate specification designation.

If the pipe is stored on site, it should be protected from sunlight.

Pipe and fittings shall meet the requirements of one of the following types or as otherwise set forth in Section 7 or on the drawings.

Steel pipe shall meet the requirements of the following specifications, as applicable:

AWWA Specification C-200.

ASTM A 53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated (Galvanized) Welded and Seamless

Steel pipe shall have a protective coating applied and shall conform to one of the following specifications, as applicable:

AWWA C203 Coal-Tar Protective Coatings and Linings For Steel Water Pipelines-Enamel and Tape-Hot Applied

AWWA C209 Cold-Applied Tape Coatings For The Exterior or Special Sections, Connections, And Fittings For Steel Water Pipelines

AWWA C214 Tape Coating Systems For The Exterior Of Steel Water Pipelines

ASTM A 123/A 123M Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A 153/A 153M Zinc Coating (Hot-Dip) on Iron and Steel Hardware

Joints and connections for steel pipe shall meet the following requirements:

Field joints shall be installed according to the manufacturer's recommendations. On buried pipelines, high-resistance joints between pipe lengths shall be electrically bridged with a welded, brazed, or soldered copper wire. If coated pipe is field welded, care shall be taken to avoid burning the protective coating. After joints are welded, they shall be covered with a coating equal in quality to that specified for the pipe and hardware.

Plastic pipe shall conform to the requirements of the following ASTM specifications, as applicable:

D 1527 Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80

D 1785 Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

D 2104 Polyethylene (PE) Plastic Pipe, Schedule 40

D 2239 Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter

D 2241 Poly(Vinyl Chloride) (PVC), Pressure-Rated Pipe (SDR)

D 2282 Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (SDR-PR)

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D 2447 Polyethylene (PE) Plastic Pipe, Schedules 40 and 80, Based on Outside Diameter

D 2513 Thermoplastic Gas Pressure Pipe, Tubing and Fittings

D 2737 Polyethylene (PE) Plastic Tubing

D 2672 Joints for IPS PVC Using Solvent Cement

D 3035 Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter

AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe, 4 inches through 12 inches

AWWA C901 Polyethylene (PE) Pressure Pipe and Tubing, ½ inch through 3 inches

Plastic pressure pipe fittings shall conform to the following ASTM specifications, as applicable:

D 2464 Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

D 2466 Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40

D 2467 Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

D 2468 Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe Fittings, Schedule 40

D 2609 Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe

D 2683 Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing

D 3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

D 3261 Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing

Solvents for solvent-welded plastic pipe joints shall conform to the following ASTM specifications, as applicable:

D 2235 Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings

D 2564 Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings

D 2855 Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings

Rubber gaskets for pipe joints shall conform to the requirements of ASTM F477, Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

Copper Pipe and appurtenances shall meet the following requirements:

Type L, Residential Use, pipe shall be used, meeting one of following ASTM specifications:

B 302 Threadless, Straight With Brazen-Joints Fittings

B 306 Seamless Drainage Tubing with Soldered Fittings

B315 Copper Alloy in Nominal or Standard Sizes, Straight Lengths for "General Engineering Purposes"

Flux shall be non-petroleum based and solder shall be a lead-free type.

CONCRETE

Concrete used for thrust blocks shall have a minimum compressive strength, at 28 days, of 3000 psi. If the supplier cannot show evidence that a mix will meet strength requirements, a mix with a maximum net water content of seven gallons per bag (94 lbs) of cement, and a minimum cement content of five and a half (5.5) bags per cubic yard of concrete, may be used.

The thrust block cavity shall be in undisturbed soil or previously placed compacted backfill that yields an acceptable allowable bearing pressure. The cavity shall be formed with soil or wood to hold the freshly placed concrete without displacement until an initial set has occurred.

When excavation beyond the designated trench widths and depths, as shown on the drawings or specified in section 7 of this specification, occurs at locations where installation of concrete thrust blocks is required, the contractor shall install an alternative thrust block provision.

The concrete thrust block shall have a thickness, length, and depth as shown on the drawings or specified in section 7. Backfill shall be placed on all sides of the thrust block and to the sides of the excavation.

OTHER APPURTENANCES

All other appurtenances, such as valves and valve housings, shall be made of non-corrosive material and shall be according to manufacturer's recommendations, section 7 and/or the drawings.

3. PLACEMENT

Pipelines shall be placed so that they are protected against hazards imposed by traffic, livestock, farm operations, freezing temperatures, or soil cracking. Other means of protection must be provided if the depth required for protection is impracticable because of shallow soils over rock or for other reasons. Abrupt changes in grade must be avoided to prevent rupture of the pipe.

Trenches for plastic pipelines shall be free of rocks and other sharp-edged materials, and the pipe shall be carefully placed to prevent damage.

Plastic pipelines may be placed by plow-in equipment if soils are suitable and rocks and boulders will not damage the pipe.

4. TESTING

The pipeline shall be pressure tested for leaks. Before pressure testing, the joints of the assembled pipeline shall be allowed to set as recommended by the manufacturer and all concrete thrust blocks shall be in place and allowed to cure for a minimum of 3 days.

Pipeline shall be pressure tested by one of the following methods:

- a. Before backfilling, fill the pipe with water and test at the design working head or at a minimum head of 10 ft., whichever is greater. All leaks must be repaired, and the test must be repeated before backfilling.
- b. Pressure test at the working pressure for 2 hours. The allowable leakage shall not be greater than one gallon per diameter inch per mile. If the test exceeds this rate, the defect must be repaired until retests show that the leakage is within the allowable limits, but all visible leaks must be repaired.

5. BACKFILLING

All backfilling shall be completed before the pipeline is placed in service. For plastic or copper pipe, the initial backfill shall be of selected material that is free of rocks or other sharp-edged material that can damage the pipe. Deformation or displacement of the pipe must not occur during backfilling.

Plastic pipelines installed by the plow-in method require surface compaction and shaping in addition to the normal plow-in operations.

Installation and backfilling shall be done in a workmanlike manner. Provisions shall be provided for stabilizing disturbed areas and controlling erosion, as necessary.

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6. SEEDING

All disturbed areas shall be revegetated according to the recommendations for permanent seeding as stated in Conservation Practice Standard 342, Critical Area Planting or the Pennsylvania Agronomy Guide.

7. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE: